FIG.1

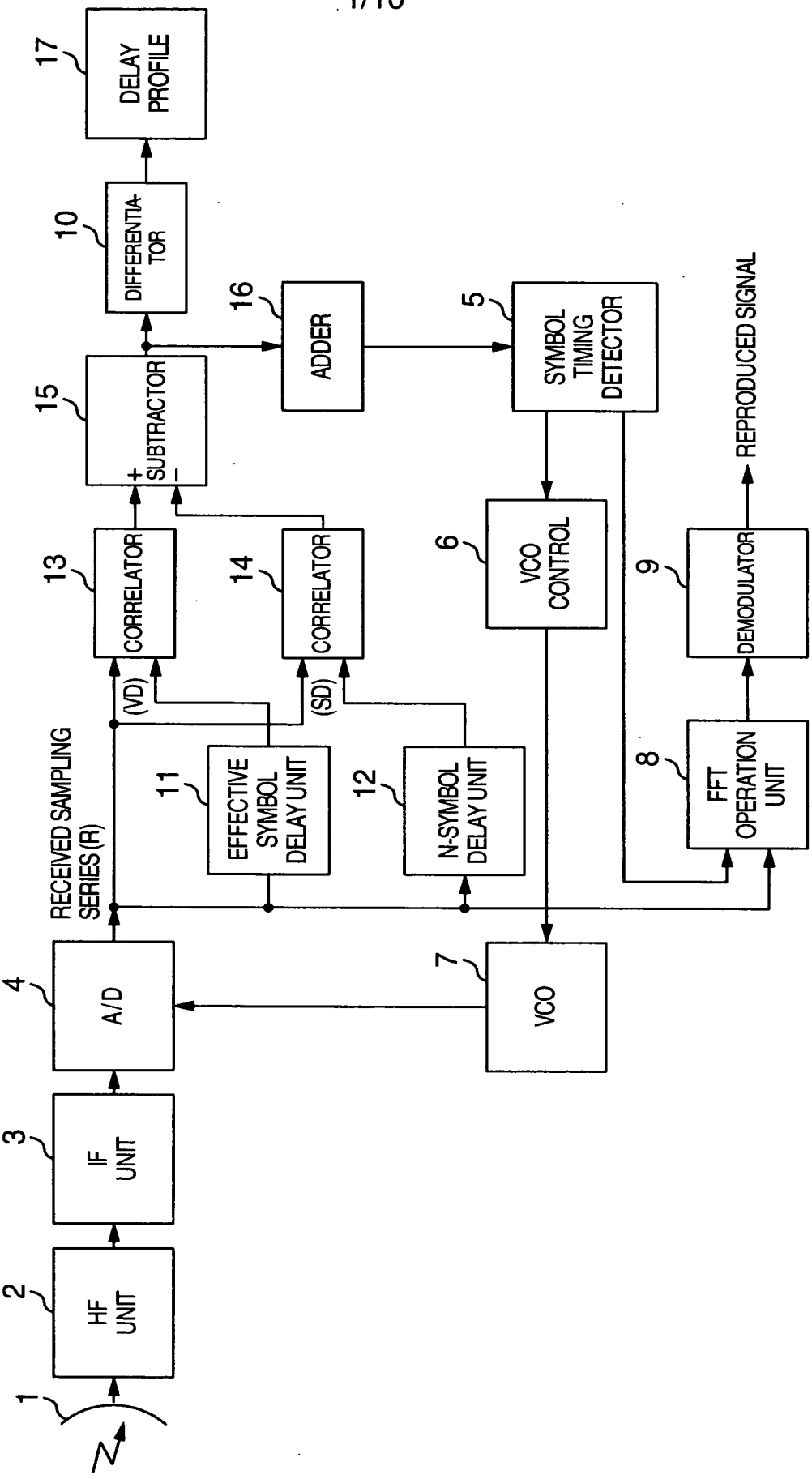

1
2
HF UNIT
3
IF UNIT
4
A/D
RECEIVED SAMPLING SERIES (R)
(VD)
(SD)
11
EFFECTIVE SYMBOL DELAY UNIT
12
N-SYMBOL DELAY UNIT
13
CORRELATOR
14
CORRELATOR
15
SUBTRACTOR
+
−
16
ADDER
17
DELAY PROFILE
10
DIFFERENTIATOR
5
SYMBOL TIMING DETECTOR
6
VCO CONTROL
7
VCO
8
FFT OPERATION UNIT
9
DEMODULATOR
REPRODUCED SIGNAL

FIG.2

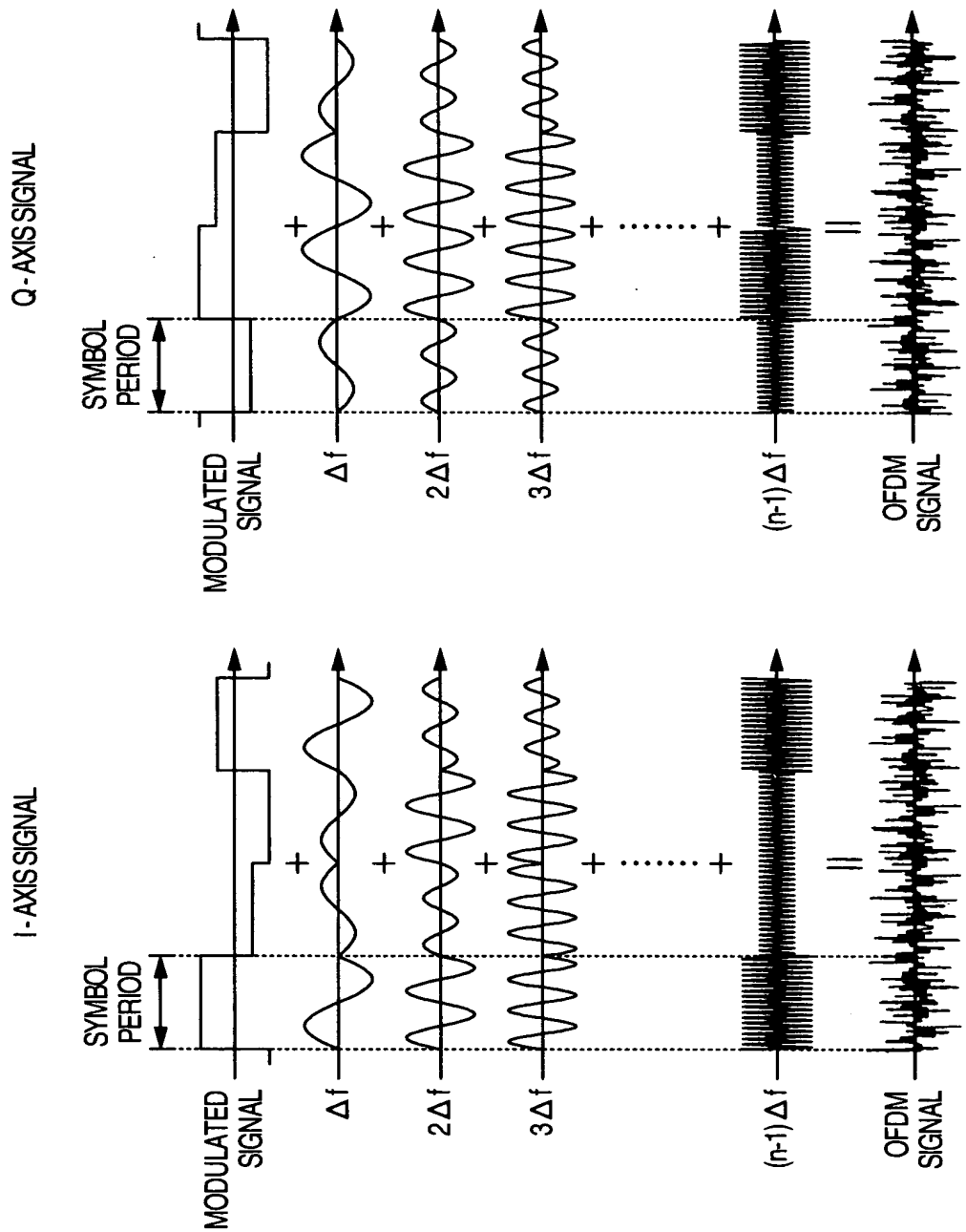

I-AXIS SIGNAL
Q-AXIS SIGNAL
SYMBOL PERIOD
MODULATED SIGNAL
Δf
2Δf
3Δf
(n-1)Δf
OFDM SIGNAL
+
=

FIG.3

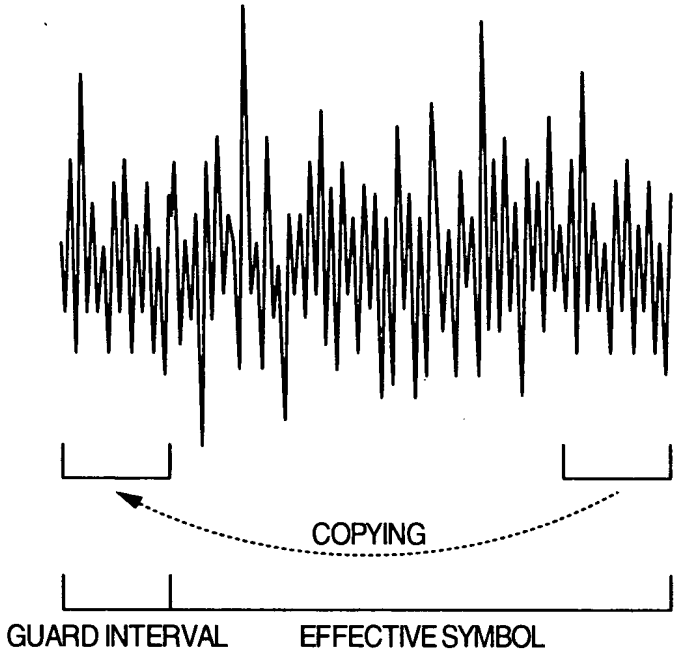


FIG.4

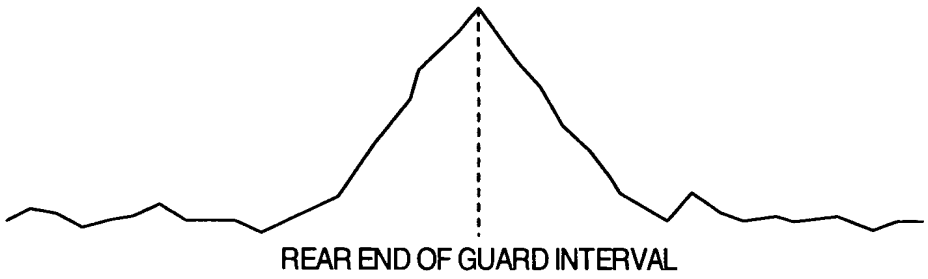


FIG.5

FIG.6

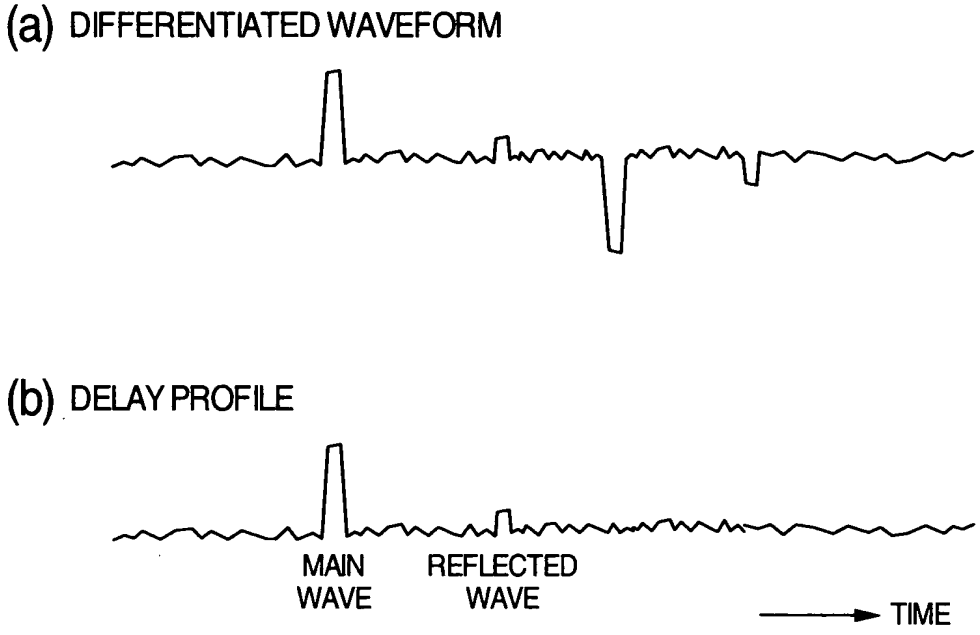

(a) DIFFERENTIATED WAVEFORM
(b) DELAY PROFILE
MAIN WAVE
REFLECTED WAVE
TIME

FIG.7

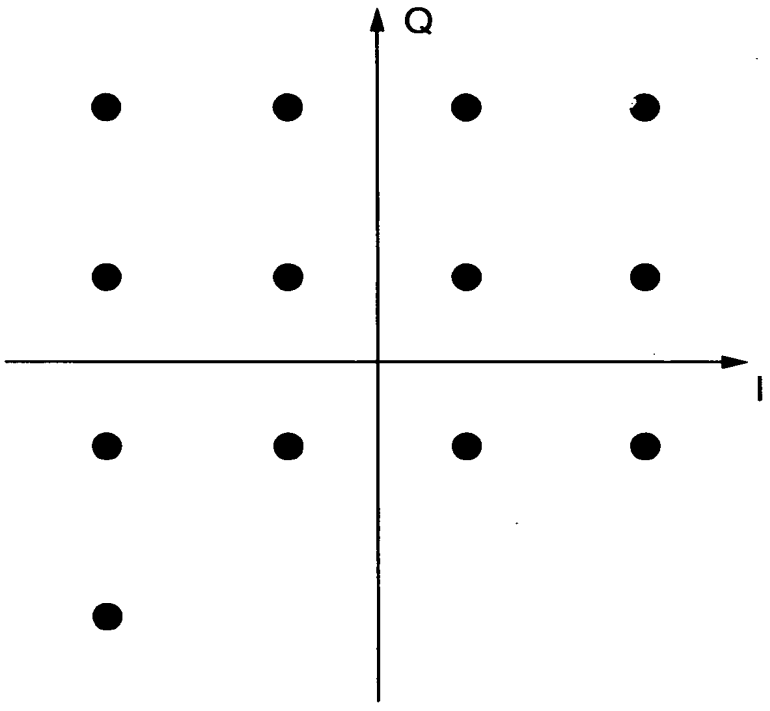

Q
I

FIG.8A

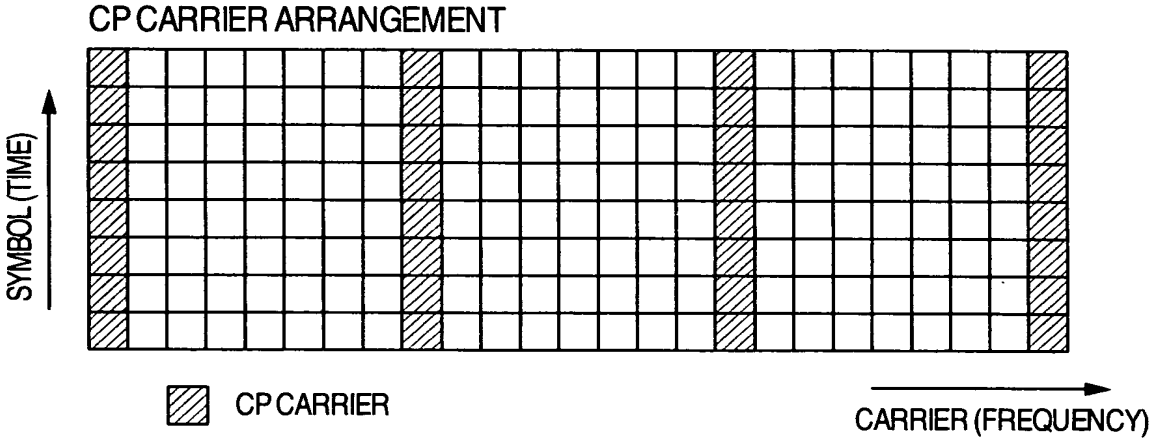


FIG.8B

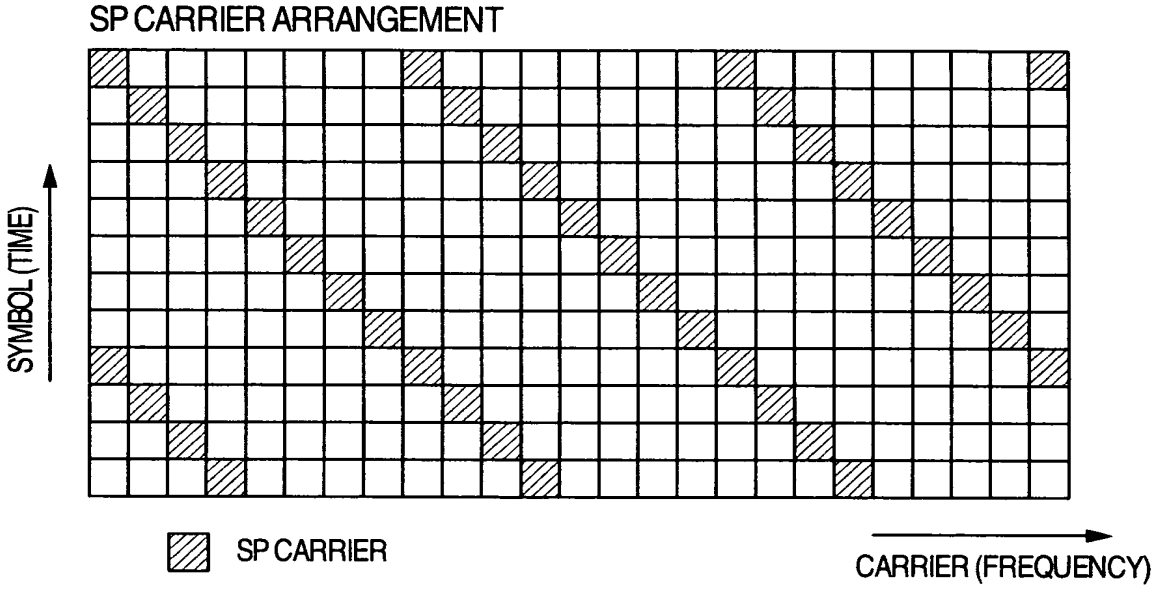


FIG.9

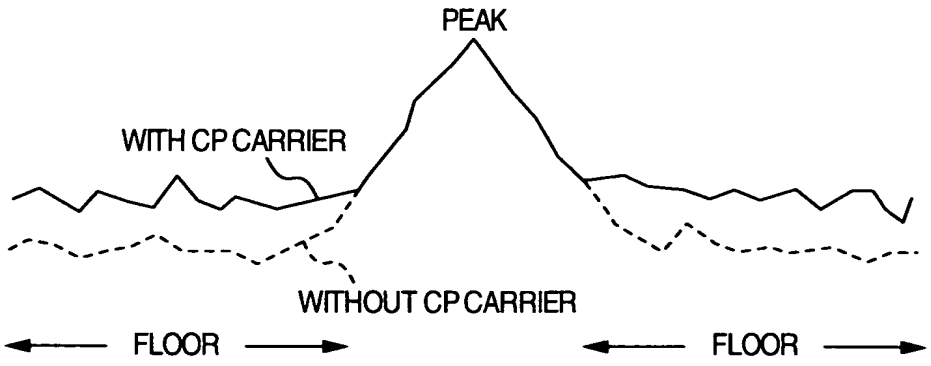


FIG.10

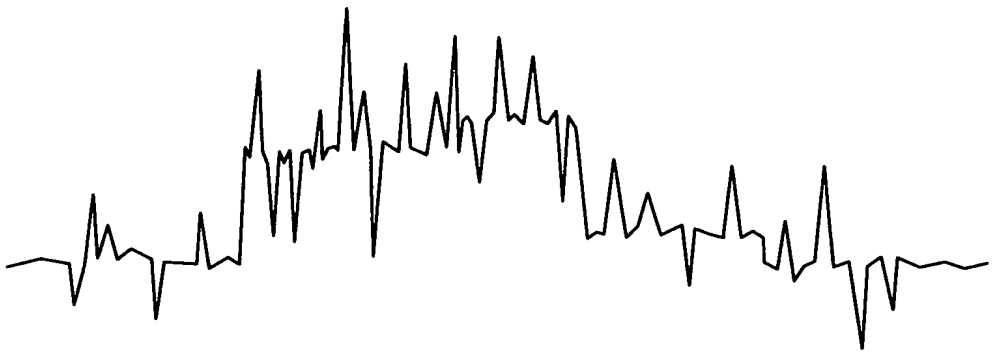


FIG.11

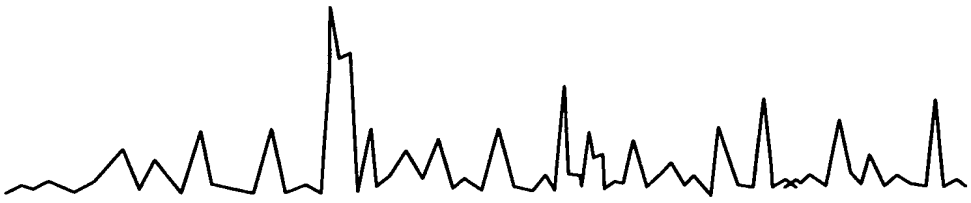


FIG.12

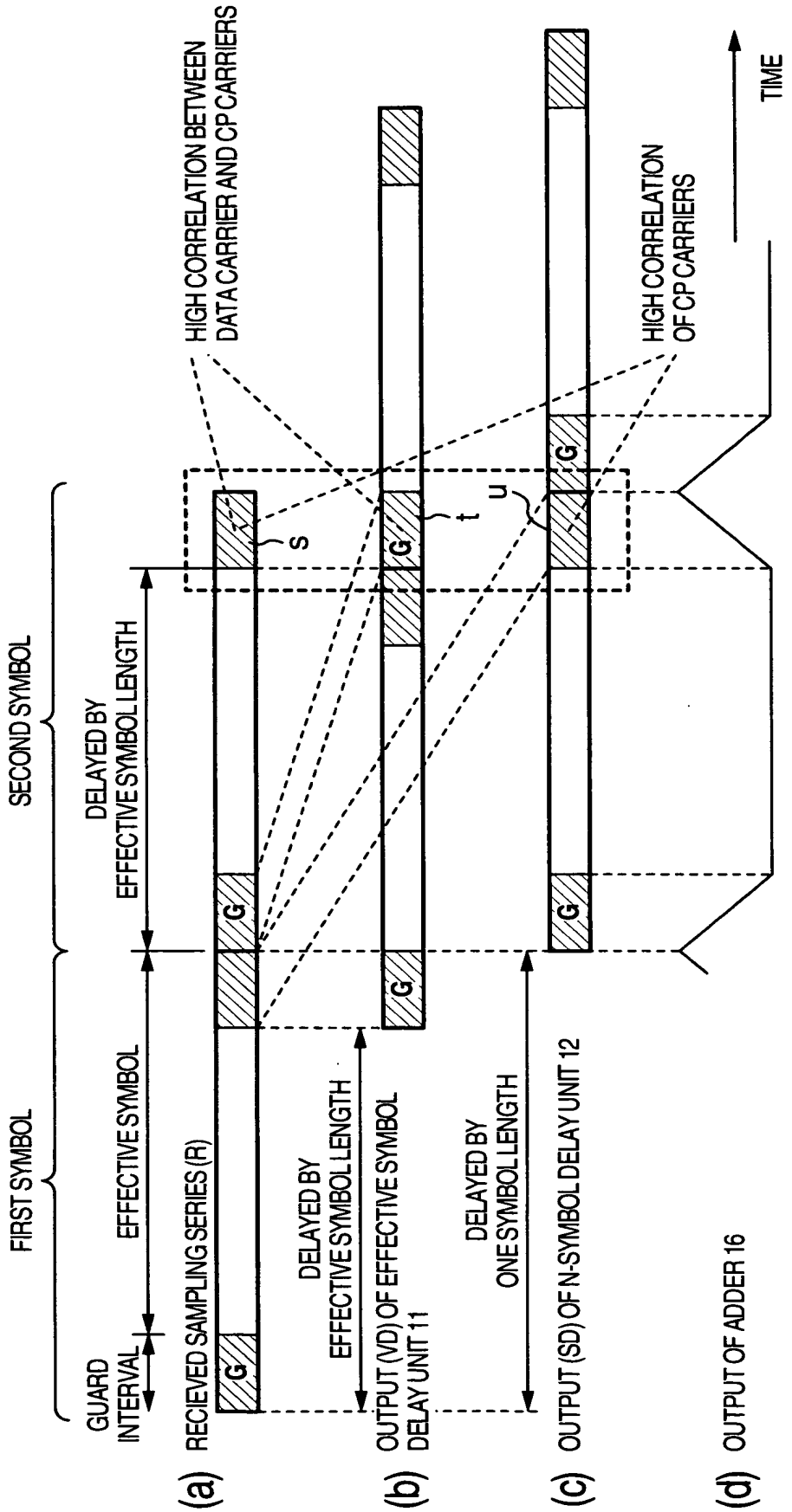

FIRST SYMBOL
SECOND SYMBOL
GUARD INTERVAL
EFFECTIVE SYMBOL
DELAYED BY EFFECTIVE SYMBOL LENGTH
HIGH CORRELATION BETWEEN DATA CARRIER AND CP CARRIERS
HIGH CORRELATION OF CP CARRIERS
TIME
(a) RECIEVED SAMPLING SERIES (R)
(b) OUTPUT (VD) OF EFFECTIVE SYMBOL DELAY UNIT 11
(c) OUTPUT (SD) OF N-SYMBOL DELAY UNIT 12
(d) OUTPUT OF ADDER 16
DELAYED BY EFFECTIVE SYMBOL LENGTH
DELAYED BY ONE SYMBOL LENGTH
G
S
t
u

FIG.13

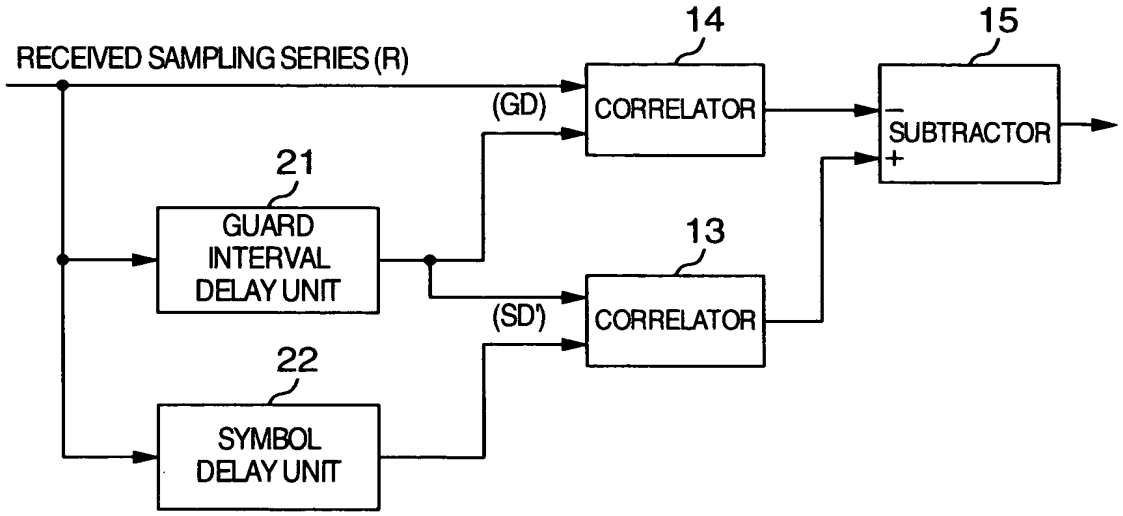

RECEIVED SAMPLING SERIES (R)
14
15
(GD)
CORRELATOR
SUBTRACTOR
21
GUARD INTERVAL DELAY UNIT
13
(SD')
CORRELATOR
22
SYMBOL DELAY UNIT

FIG.15

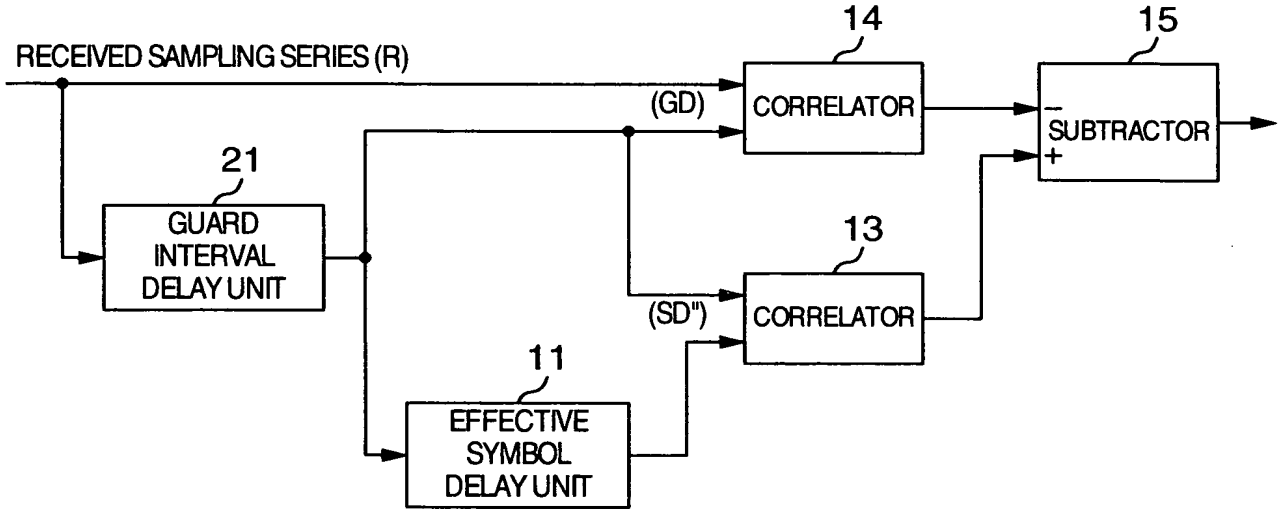

RECEIVED SAMPLING SERIES (R)
14
15
(GD)
CORRELATOR
SUBTRACTOR
21
GUARD INTERVAL DELAY UNIT
13
(SD")
CORRELATOR
11
EFFECTIVE SYMBOL DELAY UNIT

FIG.14

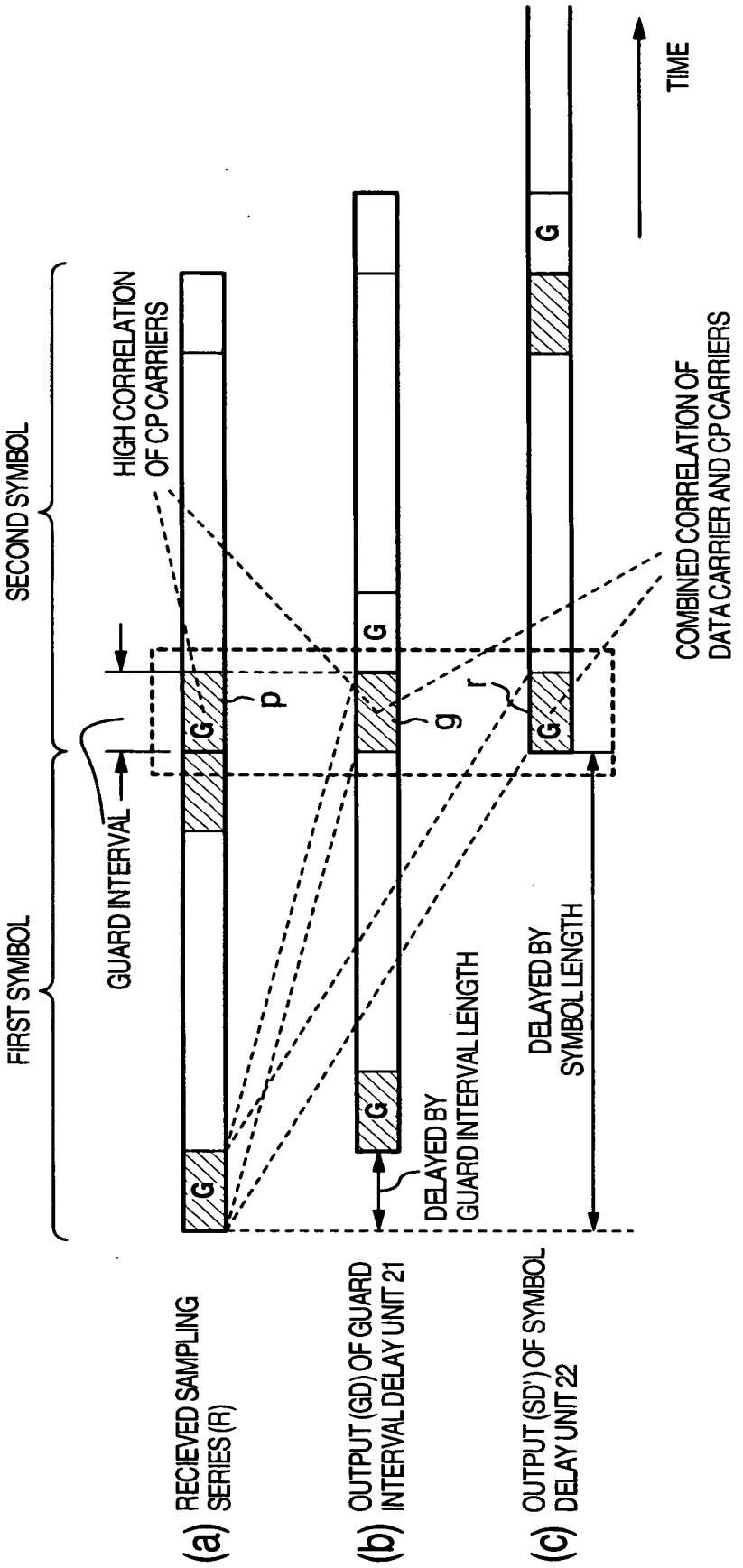
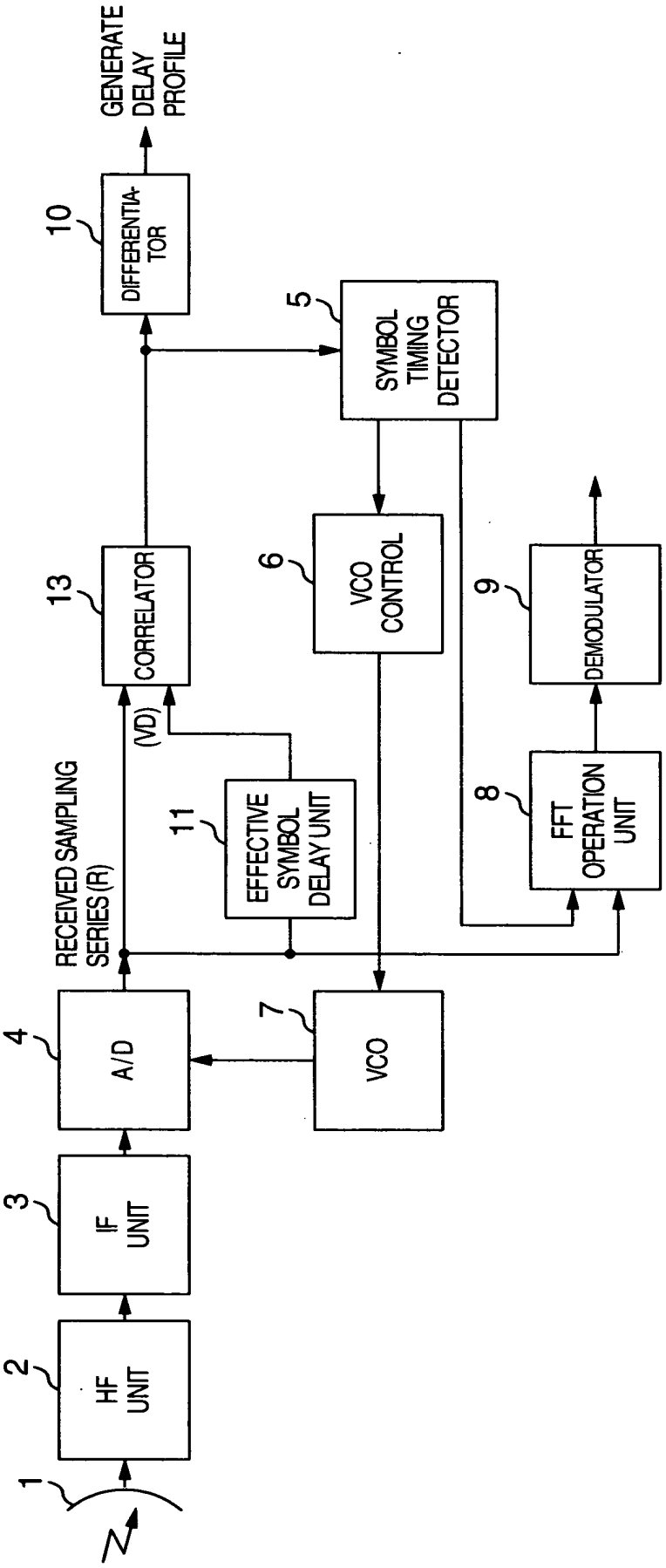

FIRST SYMBOL
SECOND SYMBOL
GUARD INTERVAL
HIGH CORRELATION OF CP CARRIERS
COMBINED CORRELATION OF DATA CARRIER AND CP CARRIERS
TIME
DELAYED BY GUARD INTERVAL LENGTH
DELAYED BY SYMBOL LENGTH
G
p
g
r
(a) RECIEVED SAMPLING SERIES (R)
(b) OUTPUT (GD) OF GUARD INTERVAL DELAY UNIT 21
(c) OUTPUT (SD') OF SYMBOL DELAY UNIT 22

FIG.16


1
2
HF UNIT
3
IF UNIT
4
A/D
7
VCO
RECEIVED SAMPLING SERIES (R)
(VD)
11
EFFECTIVE SYMBOL DELAY UNIT
13
CORRELATOR
6
VCO CONTROL
5
SYMBOL TIMING DETECTOR
10
DIFFERENTIATOR
GENERATE DELAY PROFILE
8
FFT OPERATION UNIT
9
DEMODULATOR